fruit; for whereas all the eastern species have very long appendages to the seed, which are no doubt instrumental in its dispersion, these appendages are very short in the Madagascar species, and are wholly absent in the Seychelle one; which thus presents a case analogous to that of the prevalence of wingless insects on oceanic islets. Lastly, the Seychelle Islands species further differs from all others in the structure of its ovary and capsule.

To sum up, deviation from the type of the genus commences on the western confines of the principal centre of its distribution, namely in Ceylon; and the initial deviation, that met with in the Ceylon species, is the slightest, but is propagated (so to speak) westwards, equally characterising the two African islands Pitcher-plants, which again deviate still further from the type; the maximum deviation, however occurs, not in the great sub-continental Island of Madagascar, where the endemic species has a considerable range; but in the very small oceanic Archipelago of the Seychelles, where the only native species is confined to the one mountain summit of one island of the group!

The only other fact that struck me as bearing upon this subject of distribution is, that though present in the Seychelles, the genus Nepenthes is absent from the Mascarene group (Mauritius, Bourbon, and Rodrigues). This is only one instance of the broad distinction that exists between the vegetation of these Archipelagos, and which is in some way connected with the fact that the Mascarene group is volcanic, the Seychelles group formed of granite and quartz. Coincident and perhaps co-ordinate with these phenomena of plant distribution, geographical position, and geological structure, are the facts that the flora of the Seychelle Archipelago is more Asiatic, and the florulæ of its several islets very uniform; whilst the florulæ of the islets of the Mascarene Archipelago differ wonderfully, and in their totality are more African than Indian. The flora of the Mascarene group may hence be regarded either as a very ancient outlying province of the African, or as consisting of a more modern assemblage of plants, derived at various periods from Africa, but subsequently much altered by causes operating in the several islets; or more probably its peculiarities are attributable to both causes. Long as the Mascarene and Seychelle islets have been colonised, under Dutch, French, and English rule, their floras are still very imperfectly known; so much, however, of Mascarene botany is known, as to show that its relations with those of the Seychelle group and Madagascar, and the relations of all these with India and Africa, are most complicated, and present one of the most puzzling problems in Phytogeographical Science.

Royal Gardens, Kew, Dec. 18 J. D. HOOKER

THE author of the notice which appeared in a recent Number of NATURE is probably unaware that a minute analysis of the "water" found in the pitcher of Nepenthes was made a few years since by Dr. Völcker. For full particulars I will refer your correspondent to "Annals and Magazine of Natural History," 27, 4, 128, and "Phil. Magazine," 3, xxxv., 192; but I may perhaps be allowed to give the results of the analysis. My extract is from Liebig and Kopp's "Annual Report, &c." "The liquid was generally clear and colourless, rarely yellowish, and reddened litmus. That which was collected from different plants gave respectively 0·92, 0·91, 0·87, 0·58, 0·62, and 0·27, per cent. of residue, which contained in 100 parts 38·61 per cent. of organic matter, consisting chiefly of malic acid with a little citric acid, 50·02 of chloride of potassium, 6·36 soda, 2·59 lime, 2·59 magnesia."

During the early part of the present year I was led to suspect the presence of some form of tanno-gallic acid in the tissue of the stalk, and the kindness of a chemical friend enabled me to verify my conclusions; but no quantitative analysis has, to my, knowledge, been made beyond the one I have referred to.

Hull, Dec. 1 H. POCKLINGTON

Cockroaches

THE facts mentioned by your correspondent, Mr. Arthur Nicols (in your number of Dec. 8), are notorious to all West Indians. A friend of mine was marked for life by these things on board a ship coming home from Jamaica.

As for their scent, if you crush one in England it smells evil enough; and I don't doubt Aristophanes's sharp Greek nose had found that out. I have known bread, &c., in the West Indies uneatable from being run over by the small dark Cockroach of England, *Blatta orientalis;* while the great pale species, *B. occidentalis*, is utterly unbearable. C. KINGSLEY

*EARED SEALS AND THEIR HABITS**

THIS paper, which forms the first number of the second volume of the "Bulletin of the Museum of Comparative Zoology at Harvard College in (Transatlantic) Cambridge," is one of great zoological importance, and likewise of much general interest. The Eared Seals, a group of marine Carnivora, which form a well-marked division of the Pinnipedia, distinguished by the possession of a small external ear-conch and other peculiarities, are still very imperfectly known, although of late years they have attracted the attention of several eminent naturalists. Unfortunately, however, the great variations which occur in the sexes and different ages of these animals, have not been sufficiently appreciated by those who have studied the few specimens of them preserved in European museums. The consequence has been that numerous artificial species have been manufactured upon stray skulls and imperfect skins, which have exhibited what were really only individual differences. Moreover, what is worse than this, under the prevailing mania for coining new generic names, more genera of Eared Seals have been established than the number of species which actually exist in nature. Foremost amongst these offenders, we regret to say, has been one of our own countrymen, who, in a recent article published in the "Annals of Natural History," has subdivided, on the most trivial characters, the family *Otariidæ* into four subfamilies and ten genera! We shall see how much more reasonable and consonant with nature are Mr. Allen's views on the arrangement of these animals.

Mr. Allen commences his paper by an Introduction, in which he discusses at some length the writings of preceding authors on this subject. He then proceeds to set forth his own views, distinguishing first of all the Eared Seals from the two other families of the Pinnipedia (the true seals and the walrus), and afterwards the different genera and species of *Otariidæ*, in a very neat and perspicuous manner. Mr. Allen is only able to recognise eight species of these animals, and considers two of these rather doubtful. Four of them belong to the "Hair-seals," or "Sea-lions," which have no under fur, and four to the smaller "Fur-seals," or "Sea-bears," which have a dense under coat, and furnish the seal-skin cloaks so much now in fashion with English ladies. The well-known "Sea-lion" in the Zoological Gardens belongs to the former group—being a female of the Southern Sea-lion (*Otaria jubata*).

Mr. Allen next begins to treat at great length of the North Pacific species of Eared Seals, of which he is able to give us a full and excellent account from the specimens in the Museum to which he is attached, together with those in other American collections. These North Pacific species are the Steller's Sea-lion (*Eumetopias Stelleri*), Gillespie's Hair seal (*Zalophus Gillespii*), and the Northern Fur-seal (*Callorhinus ursinus*). Of these three animals such full particulars are given that it seems scarcely possible that there can be any more confusion respecting them. But the most remarkable part of the present memoir is perhaps the account of the extraordinary habits and customs of the Northern Fur-seal, given from Captain Bryant's observations of these animals, on the Pribyloff Islands, off the Northern part of Alaska Territory. As is the case in other known species of Eared-Seals, there is an enormous discrepancy in the size and weight of the two sexes, the weight of the female being rarely more than one-fourth of that of the full-grown male.

The Fur-seals resort to the Pribyloff Islands during the summer months for the purpose of breeding, and in St. Paul's Island, where Captain Bryant made his obser-

* "On the Eared Seals (*Otariadæ*), with detailed Descriptions of the North Pacific Species." By J. A. Allen. Together with an Account of the Habits of the Northern Fur Seal (*Callorhinus ursinus*). By Charles Bryant. With Three Plates. 8vo. 108 pp. (Cambridge: University Press. 1870.)

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vations, occupy at this season a belt of loose rocks along the shore, varying in width from five to forty rods. Twelve miles of shore line at least are taken up by what is called their "*breeding rookeries*" in this island, and are tenanted by not less than 1,152,000 breeding males and females, according to Captain Bryant's estimate. Each male seal stations himself in a particular spot, usually the same as he has occupied in former years, and keeps about a square rod of ground free around him to afford space for the reception of his ten or fifteen wives. By the 15th of June all the males have arrived, and have stationed themselves each in his own domain, not without constant growlings and fightings with his neighbours for what he considers the best station. The young males are not allowed to take a place in the "rookeries," but are driven by the patriarchs back into the sea, or compelled to resort to the high rocks above. After the middle of June, the females arrive; in small numbers at first, but increasing as the season advances, until the middle of July, by which time they are so crowded together that they often overlap one another. The old males who are nearest the shore seize upon the females at once, and of course fill their harems first. But the males who are higher up on the rocks select the time when their more fortunate neighbours are off guard to steal their wives, taking them up in their mouths, and carefully carrying them off to their own dominions, as a cat would her kittens. Struggles often occur between two males for the possession of the same female, and both seizing her at once, terribly lacerate her with their teeth. When his harem is full, the old male struts complacently around reviewing his domestic circle, and fiercely driving off all intruders. Two or three days after landing and taking up her abode, the female brings forth her single pup, after which she is ready to associate with the male. By the middle of August the young are all born, and the females are again pregnant. The old males having been constantly in their stations for four months *without food*, now leave the females and young to the company of the younger males, and go off-shore to feed. At the end of October the whole body of seals leave the island and journey southwards.

The greatest care is taken by the hunters never to disturb the breeding places of the seals in any way, and the only seals killed for the sake of their fur are the younger animals (principally males) that resort to the higher rocks above the rookeries to pass the night. A party of men armed with clubs surround a portion of the herd and drive them off sometimes six or seven miles across the island, to the place selected for killing and skinning them. By this plan the rookeries are less liable to be alarmed, and the seals are made to carry their own skins to the salting houses, which would otherwise be a work of much labour. At the present time the annual yield of seal-skins from the Pribyloff Islands is estimated to have reached 100,000, and the killing yearly of this number is believed in no way to check their increase, but rather to augment it.

This short sketch will serve to give an idea of Captain Bryant's account of the extraordinary habits of this animal, and of the way in which the large annual supply of the much-valued seal-skin coats of civilised life is produced. Many other details of the highest interest are added, for which we must refer our readers to the original article. Although several accounts have been already published of the habits of other species of this group, none, we believe, is so full and perfect as the present, which forms a valuable appendix to Mr. Allen's excellent essay already spoken of. In short, it may be truly said that, by this single memoir, more extensive knowledge has been gained concerning this little-known group of mammals than by the half-dozen different systems of arrangement of them which have lately emanated from the British Museum, and the publication of an indefinite number of (so-called) new genera and species founded upon stray skulls and imperfect skins. P. L. S.

SCIENTIFIC TEACHING IN ELEMENTARY SCHOOLS

THE following address, signed by Prof. Huxley, as President of the British Association, has been presented to the Vice-President of the Council by a deputation, consisting of the President of the Association, the General Secretaries, and the Treasurer; Sir Charles Lyell, Bart.; Sir John Lubbock, Bart., M.P.; Dr. Lyon Playfair, M.P.; and Mr. Francis Galton:—

"The deputation from the Council of the British Association for the Advancement of Science waits upon you for the purpose of urging the advisability of including elementary Natural Science among the subjects for which payments are to be made under the authority of the Revised Code. We have asked you to receive us at the present time because we understand that you have announced your intention of making certain modifications in the Code. Our reasons for requesting you to give direct encouragement to the teaching of Natural Science in elementary schools are three. Firstly, we conceive such teaching to be one of the best instruments of education in the sense of intellectual discipline, and in many respects better calculated to awaken intellectual activity than other studies; secondly, we think that a knowledge of the elements of Natural Science has a high value as information; and thirdly, we are of opinion that scientific training and teaching in the elementary schools will afford the best possible preparation for that technical education of the working classes which has become indispensably necessary to the industrial progress of the country.

"We take the liberty of pointing out to you that, in asking for the introduction of scientific teaching into the elementary schools, we are not seeking for the creation of a new system or even of new executive machinery. The Science and Art Department does already provide for elementary scientific instruction; and all that is necessary to fulfil our desire is, that the system of the Science and Art Department and that of the Revised Code shall be brought into harmonious co-operation. In preferring the request that instruction in the elements of Science shall be made part of the regular course of instruction of all elementary schools, we desire carefully to guard against the supposition that we are seeking for such an amount of this kind of instruction as would interfere with the teaching of reading, writing, and arithmetic, and the other essential constituents of primary education. On the contrary, we think it very desirable that systematic instruction in elementary Science should be given only to those scholars who are able to read and write fairly; that it should be limited to certain well-defined subjects, such for example as elementary physical geography, elementary physics and chemistry, elementary botany, and, in consequence of its relation to the public health, elementary human physiology; and that care should be taken to make the instruction, so far as may be, real and practical.

"Finally, we desire to point out that such scientific instruction in the elementary schools as we pray for, would afford a means by which any child of exceptional aptitude for scientific pursuits might obtain the education suited to its capacity in the higher schools, and that in this way advantages similar to those which are offered by the scholarships and exhibitions of grammar-schools to the children of the well-to-do classes of society, would be extended to the poor and necessitous. In other countries in which well-organised systems of secondary education for the working classes exist, it has been found necessary to give a taste for Science in the elementary schools, so that the youth of the country may be induced to take advantage of the more advanced schools. While, therefore, we look with pleasure to the introduction of Science into the endowed schools of the country, we still believe that it will be necessary to link them to the elementary schools by commencing instruction in Science in the latter."

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